Construction Management

University of Missouri-Columbia

**Planning, Design & Construction**
**Campus Facilities**
117 General Services Building
Columbia, MO 65211-3200

PHONE (573) 882-1133
FAX (573) 882-1175
Date:

**Project:**

# Unit Substation Construction Checklist (Main Load Break Disconnect)

| | |
|---|---|
| **Project:** | |

| | |
|---|---|
| **Date:** | |
| **Building:** | |
| **Location:** | |

**Submittal / Approvals**

**Submittal.** The above equipment and systems integral to them are complete and ready for functional testing. The checklist items are complete and have been checked off only by parties having direct knowledge of the event, as marked below, respective to each responsible contractor. This construction checklist is submitted for approval, subject to an attached list of outstanding items yet to be completed. A Statement of Correction will be submitted upon completion of any outstanding areas. None of the outstanding items preclude safe and reliable functional tests being performed. ___ **List attached.**

| | | | |
|---|---|---|---|
| | | | |
| Electrical Contractor | Date | General Contractor | Date |

Construction checklist items are to be completed as part of startup & initial checkout, preparatory to performing test procedures.

- This checklist does not take the place of the manufacturer's recommended checkout and startup procedures or report.
- If this form is not used for documenting, one of similar rigor shall be used.
- Contractors assigned responsibility for sections of the checklist shall be responsible to see that checklist items by their subcontractors are completed and checked off.

**Approvals.** This filled-out checklist has been reviewed. Its completion is approved with the exceptions noted below.

| | | | |
|---|---|---|---|
| | | | |
| Commissioning Authority | Date | Owner's Representative | Date |

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| **Substation Information** | | | |
|---|---|---|---|
| **Equipment Tag** | | **Location** | |
| **System** (Circle one) | ☐ Power **or** Lighting ☐ | ☐ 208-120 **or** 480-277☐ | ☐ Normal **or** Emergency ☐ |
| **Manufacturer** | | **Model Number** | |
| **Serial Number** | | **Short Circuit Capacity** | |
| **Volts/Phase Rating** | | **Main Bus Amperage** | |
| **Service Area** | | **Fuse Type & Amperage** | |
| **Comments:** | | | |

| **Associated Checklists** | | | | | |
|---|---|---|---|---|---|
| **Transformer** | ☐ | **Switchgear** | ☐ | **Other** | ☐ |
| **Comments:** | | | | | |

| **Requested documentation submitted** | **Rec'd** | **Comments** |
|---|---|---|
| Manufacturer's cut sheets | ☐ | |
| Installation and startup manual and plan | ☐ | |
| O&M manuals | ☐ | |
| Factory test results | ☐ | |
| Sequences and control strategies | ☐ | |
| Warranty Certificate | ☐ | |
| | | |
| **Comments:** | | |

| **Substation Enclosure/Cabinetry** | | | |
|---|---|---|---|
| **Check if Acceptable; Provide comment if unacceptable** | | **NA** | **Comment** |
| Equipment installed per manufacturer's instructions and specifications | ☐ | ☐ | |
| Equipment installed agrees with shop drawings and specifications | ☐ | ☐ | |

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| | | | |
|---|---|---|---|
| Verify mounting, location and clearances are per plans and specifications | ☐ | ☐ | |
| Inspect for physical, electrical and mechanical condition of equipment and cabinet - no damage evident | ☐ | ☐ | |
| Inspect panels and doors for proper fit and alignment | ☐ | ☐ | |
| Equipment labels permanently affixed | ☐ | ☐ | |
| Panel is clean and clear of dust or dirt | ☐ | ☐ | |
| Verify the application of manufacturer recommended torque values applied to bolted connections | ☐ | ☐ | |
| Verify correct circuit breaker sizes and types per the specifications and manufacturer's drawings | ☐ | ☐ | |
| Seismic anchoring installed and functional where applicable (non-short circuiting) | ☐ | ☐ | |
| Verify that all manufacturer control wiring between shipping splits is properly connected per manufacturer's drawings and specifications | ☐ | ☐ | |
| Inspect insulators, barriers and shields for damage or contamination | ☐ | ☐ | |
| Verify that ground bus is properly bonded to enclosure, enclosure is grounded and resistance to ground meets grounding specifications | ☐ | ☐ | |
| Neutral bus isolated from cabinet | ☐ | ☐ | |
| Verify three or four wire configuration | ☐ | ☐ | |
| Metering transformer nameplate matches specified and approved transformer | ☐ | ☐ | |
| Transformer installed per manufacturer's instruction, plans and specifications | ☐ | ☐ | |
| Inspect metering transformer cables and connections for defects or physical damage | ☐ | ☐ | |
| Verify metering transformer connections are correct per the single line | ☐ | ☐ | |
| Verify all grounding and shorting connections for the metering transformer are in place | ☐ | ☐ | |
| Verify correct fusing for the metering transformer primary and secondary | ☐ | ☐ | |
| Verify the metering transformer taps are in accordance with the manufacturer's nameplate and specifications | ☐ | ☐ | |
| Verify the vents and air inlets are free and unobstructed. Clean air filters installed (if required) | ☐ | ☐ | |
| Megger test of bus – phase to phase and phase to ground. Test voltage per manufacturer's recommendations | ☐ | ☐ | |
| Hi-potential test of bus – phase to phase and phase to ground. Test voltage per manufacturer's recommendations | ☐ | ☐ | |
| | | | |

| **Operational Checks** |
|---|

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| Check if Acceptable; Provide comment if unacceptable | | NA | Comment |
|---|---|---|---|
| Specified sequences of operation and operating schedules have been provided with all variations documented | ☐ | ☐ | |
| Specified point-to-point checks have been completed and documentation record submitted for this system | ☐ | ☐ | |
| Verify all incoming cables are terminated and "ABC" phasing is correct. Terminations are torqued, checked, stress cones are properly grounded and exposed energized surfaces are insulated | ☐ | ☐ | |
| | | | |

## Sensor and Actuator Calibration

All field-installed sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated in accordance with Specification Section 01810. All test instruments shall have had a certified calibration within the last 12 months: **Y/N_____.** Sensors installed *in* the unit at the factory with calibration certification provided need not be field calibrated.

| Sensor or Actuator Tag & Location | Location OK | *1st* Gage or BAS Value | Instrument Measured Value | *Final* Gage or BAS Value | Pass Y / N |
|---|---|---|---|---|---|
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**Comments:**

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***Fill out all form fields before signing!**

| Name | Organization | Title | Signature |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

University of Missouri Commissioning Authority

(Place Digital Locking Stamp Here)